Technical Publication Transfer

Using:

Interleaf, Incorporated's Data

MIL-D-28000A (IGES)
MIL-M-28001A (SGML)
MIL-R-28002A (Raster)
MIL-D-28003 (CGM)

Quick Short Test Report

07 July 1993

Prepared for

Electronic Systems Center

19960822 153
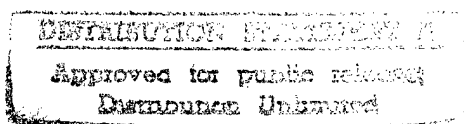
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Quick Short Test Report

07 July 1993

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Contents

1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-Cysle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Interleaf's interpretation and use of the CALS standards in transferring technical publications data. Interleaf used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape.

The tape was part of an Air Force CALS Test Bed (AFCTB) SGML transfer demonstration. The goal of the demonstration was to prove the interoperability of CALS files across a wide range of applications and platforms.

2. Test Parameters

Test Plan:	AFCTB 93-068
Date of Evaluation:	07 July 1993
Evaluator:	George Elwood Air Force CALS Test Bed DET 2 HQ ESC/AV-2P 4027 Colonel Glenn Hwy Suite 300 Dayton OH 45431-1672
Data Originator:	Nicola Morbelli Interleaf, Inc. Prospect Place 9 Hillside Avenue Waltham MA 02154 (617) 290-4990 x3419

Data Description: Technical Manual Test
        1 Document Declaration file
        1 Document Type Definition (DTD)
        1 Initial Graphics Exchange Specification
            (IGES) file
        1 Text/Standard Generalized Markup Language
            (SGML) file
        5 Raster files
        3 Computer Graphics Metafile (CGM) files

Data Source System:
    1840
        HARDWARE
            Unknown
        SOFTWARE
            Interleaf

    IGES
        HARDWARE
            Unknown
        SOFTWARE
            Unknown

Text/SGML
>   **HARDWARE**
>   Unknown
>   **SOFTWARE**
>   Interleaf

Raster
>   **HARDWARE**
>   Unknown
>   **SOFTWARE**
>   Interleaf CALS Application

CGM
>   **HARDWARE**
>   Unknown
>   **SOFTWARE**
>   Interleaf CALS Application

Evaluation Tools Used:

MIL-STD-1840A (TAPE)
>   SUN 3/280
>   AFCTN *Tapetool v1.2.10 UNIX*
>   XSoft *CAPS/CALS v40.4*
>   Texas Instruments (TI) *Tapetool v1.0.1*
>   PC 486/50
>   AFCTN *Tapetool v1.2.10 DOS*

MIL-D-28000 (IGES)
>   Sun SparcStation 2
>   ArborText *iges2draw*
>   Carberry *CADLeaf Plus v3.1*
>   IGES Data Analysis (IDA) *Parser/Verifier v92*
>   IDA *IGESView v3.05*
>   PC 486/50
>   AUTODESK *AutoCAD 386 R12*
>   Cadkey *Cadkey v5.02*
>   IDA *IGESView Windows*

MIL-M-28001 (SGML)
>   SUN SparcStation 2
>   ArborText *ADEPT v4.2.1*
>   PC 486/50
>   Exoterica *XGMLNormalizer v1.2e3.2*
>   Exoterica *Validator v2.0 EXL*
>   McAfee & McAdam *Sema Mark-it v2.3*
>   Public Domain *sgmls*

MIL-R-28002 (Raster)

SUN SparcStation 2

ArborText *g42tiff*
Carberry *CADLeaf Plus v3.1*
AFCTN *validg4*
AFCTN *calstb.475*
IDA *IGESView v3.0*
Island Graphics *IslandPaint v3.0*

PC 486/50

AFCTN *validg4*
IDA *IGESView Windows*
Inset Systems *HiJaak v2.1*
Inset Systems *HiJaak Window v1.0*
Corel *Ventura Publisher*

MIL-D-28003 (CGM)

SUN SparcStation 2

ArborText *cgm2draw*
Island Graphics *IslandDraw v3.0*
Carberry *CADLeaf Plus v3.1*

PC 486/50

Advance Technology Center
(ATC) *MetaView R 1.12*
ATC *MetaCheck R 2.05*
Software Publishing Corporation
(SPC) *Harvard Graphics v3.05*
Inset Systems *HiJaak v2.1*
Inset Systems *HiJaak v1.0 Windows Pro*
Micrografx *Designer v3.1*
Corel *Ventura Publisher*

**Standards
Tested:**

MIL-STD-1840A
MIL-D-28000A
MIL-M-28001A
MIL-R-28002A
MIL-D-28003

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the AFCTB enclosed in a box in accordance with ASTM D 3951. The exterior of the box was marked with a magnetic tape warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The tape was enclosed in a barrier bag as required by MIL-STD-1840A, para. 5.3.1.2. Inspection of the tape reel showed the label indicating the recording density was missing. This label is required by MIL-STD-1840A, para. 5.3.1. Some 9-track tape units require this BPI to be set manually. Enclosed in the box was a packing list showing all files recorded on the tape. The tape recording density was indicated on the packing list as 16000BPI but was found to be 6250BPI.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The tape was run through the AFCTN *Tapetool v1.2.10* utility. No errors were encountered while evaluating the contents of the tape labels.

The tape was read using the XSoft *CAPS read1840A* utility but generated a CORE dump when reading the second CGM file.

The tape was read using the TI *Tapetool v1.0.1*, which resulted in a CORE dump during the evaluation process.

The physical tape structure meets the CALS MIL-STD-1840A requirements.

3.2.2 Declaration and Header Fields

One error was found in the Document Declaration file. The change level record was recorded as **ORIGINAL 1 19930326.** MIL-STD-1840A, para. 5.1.1.2.

chglvl: ORIGINAL 1 19930326
*** ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid change level encountered.
*** NOTE (MIL-STD-1840A; 5.1.1.2) - Change level should be the word ORIGINAL
    or a Revision Number followed by a Change Level Number followed by
    a Change Level Date. They should be separated by a comma or space.

No errors were reported in the data file headers.

This portion of the tape does not meet the CALS MIL-STD-1840A requirements.

NOTE: Per Harvey Bingham, of Interleaf, "The CHGLVL record is as we received it. We did not have any contractual authority to issue a new revision number or date, even though we did add to the document set. Comma separators wer omitted in what we received, and we preserved them in that form. That was indeed our manual processing error, not an inherent problem with our software."

4. IGES Analysis

The tape contained one IGES file. This file was evaluated using IDA's *parser* and *verifier* set for CALS Class I, and were reported as being bad files. A visual inspection of the files showed they were not formatted correctly. The error was found starting on line two of the IGES file. One additional character was added to each line which made the format specific file unreadable. It was noted that the nl and cr characters were located in the file, and are considered the source of the errors.

The IGES file does not meet the CALS Class I MIL-D-28000A specification due to the errors in the file.

NOTE: Per Harvey Bingham, of Interleaf, "The IGES material was damaged as we received it, so all we did was pass it on as it was received."

5. SGML Analysis

The AFCTB has several parsers available for evaluating submitted DTD and Text files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. These products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings unless specified in the report. Changes to DTD or Text files required by each system are not documented in the report.

The Text and DTD files from this document were evaluated using Exoterica's *Validator exl* parser with no reported errors.

The Text and DTD files from this document were tested using Exoterica's *XGMLNormalizer* parser with no reported errors.

The Text and DTD files from the tape were evaluated using McAfee & McAdam's *Sema Mark-it* parser with no reported errors.

The Text and DTD files from the tape were evaluated using Public Domain's *sgmls* parser with no reported errors.

The Text file was imported into ArborText's *Adept* software and published. A copy of the title page is included in the Appendix to this report.

The SGML files meet the CALS MIL-M-28001A specification.

6. Raster Analysis

The tape contained five Raster files. All five files were evaluated using the AFCTN *validg4* utility. This program reported that the files meet the CALS MIL-R-28002A specification.

The files were read into the AFCTN *calstb.475* viewing utility. No problems were noted.

The AFCTB has several tools for viewing Raster files. These tools are not used to generate a pass/fail but to report how

commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The files were converted using ArborText's *g42tiff* utility without a reported error. The resulting files were read into Island Graphics' *IslandPaint*, displayed and printed.

The Raster files were read into Carberry's *CADLeaf* software without a reported error. The images were displayed and printed.

The files were read into IDA's *IGESView* and *IGESView for Windows* without a reported error.

The files were read into Inset Systems' *HiJaak for Windows* without a reported error.

The files were converted using Inset Systems' *HiJaak for DOS* into an IMG format without a reported error. The resulting files were read into Corel's *Ventura Publisher*, displayed and printed.

The Raster files were converted using Rosetta Technologies' *Prepare* without a reported error. The resulting files were read into Rosetta Technologies' *Preview*, displayed and printed.

The Raster files meet the CALS MIL-R-28002A specification.

7. CGM Analysis

The tape contained three CGM files. The files were evaluated using ATC's *MetaCheck* with CALS options. This tool reported that all three files meet the CALS MIL-D-28003 specification.

The AFCTB has several tools for viewing CGM files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor and indication

of CALS capability. All operations were performed using the default settings.

The CGM files were converted using ArborText's *cgm2draw* utility without a reported error. The resulting files were read into Island Graphics' *IslandDraw*, displayed and printed.

The files were viewed using ATC's *MetaView* software with reported font errors.

The files were read into Carberry's *CADLeaf* software and displayed with no reported errors.

The files were read into Inset Systems' *HiJaak for Windows* without a reported error.

The files were imported directly into Island Graphics' *IslandDraw* without a reported error.

The files were imported into the Micrografx *Designer* without a reported error.

The files were imported into SPC's *Harvard Graphics 3.05* without a reported error.

The files were imported into Corel's *Ventura Publisher* without a reported error.

The CGM files meet the CALS MIL-D-28003 specification.

8. Conclusions and Recommendations

The physical structure of the submitted tape had no reported errors. The Declaration file had one reported error in the chglvl record. This portion of the tape does not meet the CALS MIL-STD-1840A requirements.

The IGES file had two reported errors and does not meet the CALS MIL-D-28000A specification.

The SGML files meet the CALS MIL-M-28001A specification.

The Raster files meet the CALS MIL-R-28002A specification.

The CGM files meet the CALS MIL-D-28003 specification.

Due to the errors in the Document Declaration file and IGES file, the tape does not meet the CALS MIL-STD-1840A requirements.

NOTE: Per Harvey Bingham, of Interleaf, "As previously noted the Interleaf submission was based on material that we received which contained the errors that we passed on.

In the material that we added to the sample document, clause 1.7.2, we detailed the following issues:

> Record ends are inconsistently handled in the material we received, graphic attributes are inadequate to size the graphics for presentation.
> The supplied DTD was used is at best an old CALS standard DTD, not its current revision 1.
> There is a reference to a graphic attribute Boardno= "wire" that did not match any received.
> The subparal titles included "." at their ends, in conflict with needs in content.
> The printed sample has less wireframe segments that when we rendered it.
> Tab characters were included in the text file we received.
> Inconsistently two spaces sometimes occur after terminal punctuation.

I'd like to thank George Elwood for his continuing help in testing our software. It has been very useful for us and we appreciate both his thoroughness and responsiveness. Please call me if you have any questions about any of these requests."

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

Air Force CALS Test Network Catalog Evaluation - Version 1.2; Release 10 (C)

```
   Standards referenced:
     MIL-STD-1840A (1987) - Automated Interchange of Technical Information
     ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                         for Information Interchange
     ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII
```

Wed Jul 7 14:09:43 1993

MIL-STD-1840A File Catalog

File Set Directory: /home/sargent/draster/Set001

Page: 1

File Name	File Type	Record Format/ Length	Block Length/Total	Selected/ Extracted
D001	Document Declaration	D/00260	02048/000001	Extracted
D001C001	CGM	F/00080	00800/000030	Extracted
D001R002	Raster	F/00128	02048/000015	Extracted
D001R003	Raster	F/00128	02048/000004	Extracted
D001C004	CGM	F/00080	00800/000040	Extracted
D001R005	Raster	F/00128	02048/000006	Extracted
D001C006	CGM	F/00080	00800/000085	Extracted
D001Q007	IGES	F/00080	02000/000381	Extracted
D001R008	Raster	F/00128	02048/000007	Extracted
D001R009	Raster	F/00128	02048/000005	Extracted
D001G010	DTD	D/00260	02048/000019	Extracted
D001T011	Text	D/00260	02048/000029	Extracted
D001H012	Output Specification	D/00260	02048/000042	Extracted

Catalog Process terminated normally.

9.2   Tape Evaluation Log

Air Force CALS Test Network Tape Evaluation - Version 1.2; Release 10 (C)
   Standards referenced:
      ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                           for Information Interchange
      ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Wed Jul 7 14:09:09 1993

ANSI Tape Import Log

Allocating tape drive /dev/rmt0...

/dev/rmt0 allocated.

VOL1CALS01   4

   Label Identifier: VOL1
   Volume Identifier: CALS01
   Volume Accessibility:
   Owner Identifier:
   Label Standard Version: 4

HDR1D001   CALS0100010001000100 93181 00000 000000ILEAF VER 1.7

   Label Identifier: HDR1
   File Identifier: D001
   File Set Identifier: CALS01
   File Section Number: 0001
   File Sequence Number: 0001
   Generation Number: 0001
   Generation Version Number: 00
   Creation Date: 93181
   Expiration Date: 00000
   File Accessibility:
   Block Count: 000000
   Implementation Identifier: ILEAF VER 1.7

HDR2D0204800260   00

   Label Identifier: HDR2
   Recording Format: D
   Block Length: 02048
   Record Length: 00260
   Offset Length: 00

************ Tape Mark ***************

  Actual Block Size Found = 2048 Bytes.

  Number of data blocks read = 1.

************ Tape Mark ***************

EOF1D001   CALS0100010001000100 93181 00000 000001ILEAF VER 1.7

  Label Identifier: EOF1
  File Identifier: D001
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0001
  Generation Version Number: 00
  Creation Date: 93181
  Expiration Date: 00000
  File Accessibility:
  Block Count: 000001
  Implementation Identifier: ILEAF VER 1.7

EOF2D0204800260   00

  Label Identifier: EOF2
  Recording Format: D
  Block Length: 02048
  Record Length: 00260
  Offset Length: 00

************ Tape Mark ***************

               <<<<< *PART OF LOG FILE REMOVED HERE* >>>>>

************ Tape Mark ***************

############ End of Volume CALS01 ##############

############ End Of Tape File Set ##############

Deallocating /dev/rmt0...

Tape Import Process terminated normally.

9.3 Tape File Set Validation Log

Air Force CALS Test Network File Set Evaluation - Version 1.2; Release 10 (C)

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information

Wed Jul 7 14:09:44 1993

MIL-STD-1840A File Set Evaluation Log

File Set: Set001

Found file: D001
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: Air Froce CALS Test Bed
srcdocid: Air Force CALS Test Bed CALS EXPO SGML Demonstration
srcrelid: NONE
chglvl: ORIGINAL 1 19930326
*** ERROR (MIL-STD-1840A; 5.1.1.2) - Invalid change level encountered.
*** NOTE (MIL-STD-1840A; 5.1.1.2) - Change level should be the word ORIGINAL
    or a Revision Number followed by a Change Level Number followed by
    a Change Level Date. They should be separated by a comma or space.
dteisu: 19930326
dstsys: Data Conversion Lab, 184-13 Horace Harding Expwy, Freshmeadows, NY
11365
dstdocid: CALS Expo SGML Demonstration
dstrelid: NONE
dtetrn: 19930701
dlvacc: NONE
filcnt: T1, G1, H1, Q1, R5, C3
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: Technical Manual
docttl: SGML TRANSFER DEMONSTRATION

1 error(s), 0 warning(s), and 1 note(s) were encountered
in Document Declaration File D001.

Found file: D001C001
Extracting CGM Header Records...
Evaluating CGM Header Records...

srcdocid: Air Force CALS Test Bed CALS EXPO SGML Demonstration
dstdocid: CALS Expo SGML Demonstration

txtfilid: W
figid: NONE
srcgph: SGMLMAP.CGM
doccls: UNCLASSIFIED
notes: NONE

Saving CGM Header File: D001C001_HDR
Saving CGM Data File: D001C001_CGM

<<<<< *PART OF LOG FILE REMOVED HERE* >>>>>

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

A total of 1 error(s), 0 warning(s), and 1 note(s) were
encountered in Document D001.

A grand total of 1 error(s), 0 warning(s), and 1 note(s) were
encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.

10. Appendix B - SGML

No reported errors.

10.1 ArborText Output

See following 18 pages.

EXPO92 DEMO

TECHNICAL MANUAL

Sample Text

IGES TRANSFER MANUFACTURING DEMONSTRATION

SGML TRANSFER DEMONSTRATION

Air Force CALS Test Bed

SGML Transfer Demonstration

CALS TEST NETWORK

15 February 1993

EXPO92 DEMO

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EXPO92 DEMO

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EXPO92 DEMO

LIST OF TABLES

CHAPTER 1

Introduction

1.1 Purpose

The Air Force CALS Test Bed (AFCTB) is tasked to evaluate CALS Technical Documentation standards. In order to accomplish this task, the AFCTB accepts and evaluates submissions from members of the CALS Test Network (CTN). As part of the evaluation the AFCTB has the ability to test CALS IGES (MIL-D-28000A), SGML (MIL-M-28001),raster (MIL-R-28002) and Computer Graphics Metafile (CGM) (MIL-D-28003) file types.

As part of the evaluation process, the AFCTB also provides files for evaluation by members of the CTN. This document is part of the on going testing of the CALS standards.

1.2 Background

This document provides the background of the dual CALS data transfer testing being run by the AFCTB for AutoFACT 92 and CALS EXPO 92. These tests will provide CALS data in both MIL-STD-1840A 9-track tape and an electronic transfer method showing the ability and capabilities of CALS data.

Track one in the test is a serial IGES transfer. The IGES file will be modified using different IGES translators and a part will be manufactured from the resulting file at each site. The data will be transferred electronically with a goal of a complete circuit in less than two weeks. Each site will send the manufactured part to the AFCTB which will display them

at both AutoFact92 and CALS EXPO 92. The sites involved in this transfer test are both military and commercial companies. The companies are both small and large businesses.

Track two is a complete CALS document transfer test. This will be the first test of multiple document systems with one document handled serially. The document consists of text, IGES, raster and CGM graphic 28000 standard images. The document will be started from the AFCTB on a MIL-STD-1840A 9-track tape. It will be passed through ten or more companies which will add a paragraphor two and graphics. The results will be published and then sent to the next site on a MIL-STD-1840A tape and a second copy will be sent to the AFCTB for validation. Military and commercial companies in both the U.S. and Canada will participate in this test.

1.3 The IGES Transfer

The basic IGES file was provided to the AFCTB by the Naval Air Warfare Center(NAWC) in Indianapolis IN. The file provided is an old Navy and Marine Corp part used on fighter aircraft to hold bombs on the wings. The part is a hook used for this purpose. While the hook in this demonstration is a Navy part, all services use similar hooks on their aircraft to hold weapons. The part used by the Navy starts as a forging which is then machined. For this demonstration, each site will use available material to manufacture the part.
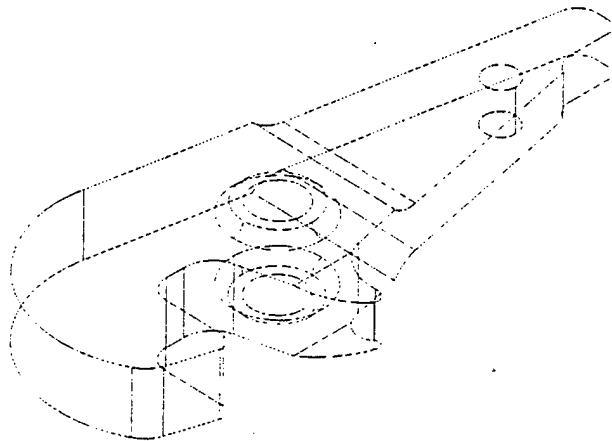

Figure 1-1 IGES Model

1-1

EXPO92 DEMO

Figure 1-2 Complete IGES Drawing

After the site receives the IGES file. they will run it through their CAD IGES translator. In their CAD system they will add a letter to the part. The letter will be engraved into the surface of the part .005 inch. The letter will actually consist of lines or curved line segments. The resulting file will be sent to the site milling machine where it will be manufactured. The CAD file will be converted back into an IGES file and sent to the next site. This process will be repeated until it has moved around the US.

The companies and military organizations that will participate in this transfer test along with CAD software and milling machine is shown below. The letter next to the name of the company will be the identifying mark on the part.

1-2

EXPO92 DEMO

1.4 IGES Transfer Test

Table 1-1   CALS IGES TRANSFER PARTICIPANTS

| Letter	Company/Organization	Location	CADSoftware	MillingMachine
	Air Force CALS Test Bed	Dayton OH	Cadkey 4.06	
A	Sikorsky Aircraft	Strantford CT	CATIA V3.0R2.3	Mazak H500/50 w/M32 Controller
B	Watervliet Army Arsenal	Watervliet NY	CALMA DDM V6.01	White Sunstrand Vertical Omnimill
C	Naval Engineering Test Establishment	Montreal Canada	Intergraph MicroStation 32 V4.0.4.6	Manual
D	Concurrent Technologies Corp	Johnstown PA	AutoCAD R11	MAHO 600-E
E	Volumatic	Macon GA	CAD	Milling
F	Marine Logistic Support Base	Albany GA	VERSA CAD AutoCAD	EZ CRM II
G	CAMcam Technologies	Winter Springs FL	SURFCAM V3.5	Milltronics Vertical Mach Ctr
H	Cleveland Advanced Manufacturing Program	Cleveland OH	Intergraph EMS v1.6, SmartCam, ProEngineer	Masco 4 Axis
I	Moore Quality Tooling	Centerville OH	Solution 3000 v5.3	Hurco BMX 40 Software 5.0
J	4950th Mod ification Center	Wright-Patterson AFB OH	Intergraph I/EMS V2.0.1.11, Maxmill V2.0.1.7	Bridgeport Series II/BOSS 8 Control
K	Enginetic	Huber Heights OH	AutoCad R11, SmartCAM v6.0	B+S 1000 TOYDA
L	Sinclair Community College	Dayton OH	AutoCAD R12	Milling
M	Naval Air Warfare Center	Indianapolis IN	Computervision CADD 4X	FAD 6030 or VMC 75
N	Rock Island Army Arsenal	Rock Island IL	Unigraphics V9.0	Cincinnati T20
O	EDS/ Unigraphics	Maryland Heights MO	Unigraphics v9.0	ACRALOC
Q	San Antonio Air Logistics Center	Kelly AFB TX	Computervision CADDS 4X R.6E	Cincinnati 10VC w/ Acramtic 900 Controller
R	Department of Energy, Sandia National Laboratories	Albuquerque NM	Anvil 5000 R11 Rev2	Monarch VMC 75 3-Axis Mill
S	Ogden Air Logistics Center	Hill AFB UT	Computervision 4X R7.0	Milling
T	Sacramento Air Logistics Center	McClellan AFB CA	CATIA	Cincinnati 15V
U	SEACOSD	Vallejo CA	CAD	Milling
W	Naval Air Warfare Center	China Lake CA	Graftek GMS v2.6	Mazak V7.5/ GMS Mazatrol

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IGES TRANSFER & MANUFACTURING
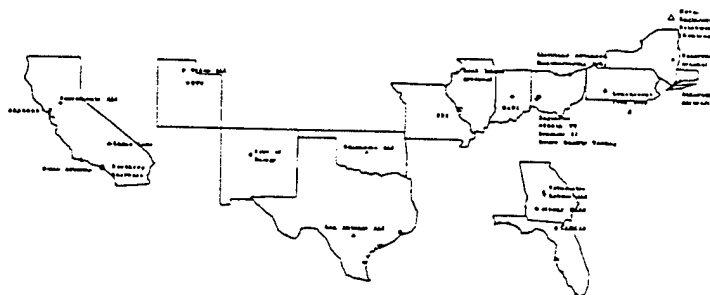
Figure 1-3 Map Showing IGES Participant Locations

1.5 Document Transfer Test

The CALS document transfer test will be the first multiple system test of CALS data. Testing to date has involved at most, two different systems. This test will involve multiple systems in two countries. Each company will use its CALS publishing system to read the document and make the required modifications. The modifications will consist of one or two paragraphs and graphic images if desired and adding the software used in the table below. The paragraphs will relate to a humorous story that was started at the AFCTB.

1.6 How This Document Was Created

This document was created on a PC using Enable 4.5 word processor. No tagging was done during this initial creation. The resulting document was saved in a UNIX ASCII format and sent to a SUN SPARC station 2 where SoftQuad's Author/Editor was used for tagging. The generic MIL-D-38784B DTD was used with the exceptionof commented out sections were removed and the external ISO character sets were commented out. A minor change was made to the ITEM tag to permit the use of WARNING and CAUTION tags. Only part of the tables were tagged at this time.

The resulting tagged document was moved back to a PC and Enable 4.5 was used to complete the tagging of the tables using a block copy procedure. The document was parsed using both the Exoterica XGML Normalizer and DataLogic ParseStation

with no reported errors. The document was read into Enable 4.5 and saved in a UNIX ASCII format and moved back to the SUN SPARC Station.

All graphics images with the exception of the sample Tech Order page were created on a PC. The two maps were created using Software Publishers (SPC) Harvard GeoGraphics and saved as CGM files. These were then read into HarvardGraphics 3.0 and modified. The modified files were then saved as CGM files. The seal on the cover was created from three files created on Harvard Graphics3.0. These were grouped together and saved as one file.

The sample Tech Order pages were scanned in from an available T.O. in the Air Force CALS Test Bed. The included pages do not relate to the part but are included as part of the entire demonstration. The raster images were converted from the scanned TIFF files to CALS raster using Inset Systems HiJaak. The converted files were then converted to IslandPaint format and cropped and cleaned up. The text from the sample T.O. was typed in the document using ArborText Adept.

An IGES file showing the hook was converted and read into Rosetta Technologies Preview. The image was rotated and saved as a CALS raster image. This file was then returned to the PC where it was read into Inset Systems HiJaak 2.0and converted into an IMG format for a test of XEROX's Ventura Publisher. The image was reconverted using HiJaak to a CALS format. This is the file used in the document. The IGES file

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contained a 3-D model which is not permitted in a type 1 CALS IGES file. The file was converted on the SUN SPARC using ArborText Adept iges2draw converter. The resulting file is included in the document.

All parts of the document were brought together using ArborText Adept and published. The parts were written to a nine-track tape using the CTN Tapetool 1.2.8.

The above information is provided for information. The number and types of software used is presented to show that CALS can move across platforms and software. No endorsement is implied with any of the named software products.

The companies and organizations involved in this test are shown in Table 1-2.. Each participant will update the table reflecting the software used during the test.

Table 1-2   CALS SGML TRANSFER PARTICIPANTS

Company/Organization	Location	Publishing System
Air Force CALS Test Bed	WPAFB OH	Enable 4.5
		SoftQuad A/E 2.3
		Exotorica XGMLNormalizer
		ArborText Adept
		Harvard Graphics 3.05
		Harvard GeoGraphics 1.0
		Rosetta Technologies Preview
		Inset Systems HiJaak 2.03
		Cadkey 4.06
		Island Graphics IslandDraw/Paint
		CTN Tapetool 1.2.8
USLynx	853 Broadway, New York, NY 10003 212-673-3210	1840A Tape Handler
		XyWrite III and Context-Wise AutoTagger
		CALS Instance Imager for 486 to validate and convert to Ventura
		HP III Printer
Sikorsky Aircraft	Stratford CT	Xyvision
Navy Publication	Washington DC	XXXXXXXXXXXX
Interleaf	Waltham MA	Interleaf CALS Application
Xyvision	Wakefield MA	XyVision Parlance Publisher
SoftQuad	Toronto Canada	SoftQuad AE 2.1
Exoterica	Ottawa Canada	XXXXXXXXXXXX
Arbortext	Ann Arbor MI	Adept 3.2
Magnavox Electronic Corp	Fort Wayne IN	xxxxxxxxxxxxxxx
Datalogics	Chicago IL	WriterStation
Intergraph	Huntsville AL	Intergraph xxxx
Texas Instruments	Plano TX	
Boeing Defense Space	Wichita KS	

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| Company/Organization	Location	PublishingSystem
IBM, FSD	Boulder CO	
Northwest Industries LTD	Edmonton Alberta, Canada	
SM-ALC/TIM	Sacramento CA	
Frame Technology	San Jose CA	XXXXXXXXXXX
WordPerfect		

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Company/Organization	Location	PublishingSystem
Northrop Corporation	Pica Rivera CA	xxxxxxxxxxxxxxx
Xerox	San Diego CA	XEROX xxxxxxxxx

CALS EXPO SGML TRANSFER TEST

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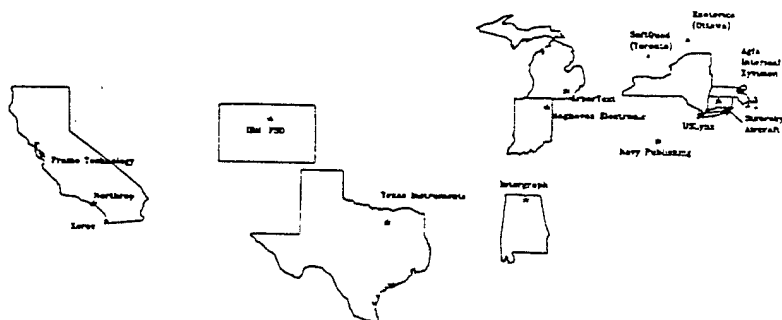
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1.7 Notes by Document Transfer Participants

This is the location for optional notes about the transfer test. Any notes inserted here will be public and available to media at the end of the test.

1.7.1 US Lynx Inc.

US Lynx would like to note that the FOSI supplied was not a CALS template but a proprietary version with certain values different from the template FOSIs in 28001A and 28001B. The page sets have different column widths, and the headers and footers are all flush right instead of quadded out, for instance. This FOSI structure is based on the unreleased (and still evolving) FOSI in 28001B and includes FOSI elements such as "algroup" whose use is yet to be documented by the FOSI committee.

Because there are specifications missing from that FOSI, US Lynx elected to use, where necessary, default values specified in the 38784B standard. Tables, for instance, are inadequately specified in the supplied FOSI. And since the defaulted format values and the "serif" face we use as a default caused our pages to set differently, we elected to do some manual style intervention, such as ignoring the "pgbrk" tag when it didn't make visual sense. We also elected to change the column values for Table 1-1 from those specified in the instance. The updates to the table added much longer material to columns four and five, which caused deep turnovers at the colwidth values given in the instance; by increasing the width of those columns (and shortening the other three columns) we achieved fewer turnover lines. We did not change the values in the instance (they are on the tape the next participant will receive).

We note that the FOSI calls for the use of external file entities for "Warning" and "Caution" heads, but these files are not exchanged via the tape. We defaulted to our standard style.

An aesthetic note: we sent two style versions of the hard copy. One follows the supplied FOSI insofar as the spec's in it were not ambiguous. The second is a style we consider closer to 38784B, using bold paragraph titles rather than underlined titles. We prefer this solution since ruling is still a little ambiguous (and changing) in the FOSI and since the underlines are always set too close to the type, especially when set with tight leading. We feel the bold titles are cleaner, more professional looking and can be supported on virtually all printers these days.

Graphic placements specified in the instance text were used as a rough guide only. The tables were enough longer and the proximity of these long tables to the graphics were such that the specifications for vertical placement could not be honored. In addition, the attribute "graphsty" is used in the instance, which should link to a value in the FOSI of "graphstyl." However no such attribute with the value "300" is included in the FOSI. Because of some ambiguity in the 28001A and B standard, we don't understand the attributes for "reprodep" and "reprowid" (1in x 1in) given for the IGES graphic.

The same graphic conversion routine could not handle both the IGESMAP and SGMLMAP CGM files (we note that the CGM files are specified in the instance's "boardno" attribute this time rather than the G4 files as last October). So we tried a conversion to PGL for the IGESMAP, and an issue became

apparent regarding mapping of vector format fonts on HP PCL and PostScript printers. For the formal hard-copy version we substituted the G4 files supplied with the tape for both maps, rather than use the CGM files.

As we reported in October's test, our Datalogics parser reported that the supplied instance had an error warning: the parser did not accept having a processing instruction after the "/doc" tag. Also as reported last October the DTD could not be automatically processed as supplied on the tape. The proper doctype start was commented out and there was also no end bracket. US Lynx had to amend the DTD by hand in order to parse the DTD. Also the text file referenced a different DTD than the DTD delivered on the tape and that declaration had to be removed to parse the document. US Lynx thinks we need to have a uniform convention for delivering DTDs, preferably one with viable DTDs as read off the tape. In the future there will be environments that are essentially "hang and print" and thus the DTD should parse as it comes off the tape.

1.7.2 Interleaf, Inc

Record ends are inconsistently handled in the material we received. The original material presumes that record ends are spaces. The material from USLynx puts in all significant spaces and puts record ends at safe places, as does Interleaf. We have attempted to rectify the words that otherwise are run together.

The graphic attributes are inadequate to size the graphics in the document. As indicated above, incorrect graphsty="300" appear, not in the FOSI sample that was supplied. We resolved the graphic sizing by hand. Incorrect reference to system entities for the graphics accompanying WARNING and CAUTION occur. We ignored them, and used our own, synthesized without requiring those entities. In fact, the DTD does not expect a graphic reference to identify the appropriate graphic associated with those tags, nor are such graphic tags present.

We used the DTD supplied, rather than the more nearly current revision 1 DTD of the same name. The supplied DTD has the warning and caution as inclusions on item. The revised DTD didn't, causing a parsing error where the warning and caution were placed. As noted in the initial commentary, this was a deliberate variation in the DTD. One of the expectations we had for CALS was that receiving systems could depend on a DTD in the absence of a workable FOSI, so that pre-designed presentations for elements in their context could be used. By arbitrarily altering the DTD supplied with a particular delivery, this may not be a valid assumption.

The received graphic HOOK1.IGS reported the error "Unknown record type S". That file was unusable. A subsequent substitution of another copy received by email had different problems.

There is a reference to a graphic entity called wire that is not present in the material we received, even though it is referenced in a graphic attribute: boardno="wire".

The subparal titles from USLynx have periods explicitly included at the ends. Those periods are not to propagate to the contents, so by our interpretation are not part of the title, and are to be supplied by the system. Support for this

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interpretation is that the old-style underscored titles of 38784B do not underscore the period following that title. When our presentation system supplies such periods, we get doubled periods.

The printed sample of has less wireframe segments visible than when we rendered it. For example, a vertical should join the rightmost two corners.

The entries by U.S.Lynx contain tab characters, which have no system-neutral, context-free interpretation, other than that of the SGML Declaration as a function SEPCHAR role.

The archaic typewriter convention of "two spaces after terminal punctuation" does occur, and should be avoided.

1.7.3 Notes by Next Participant

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1-10 (blank)

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CHAPTER 2
Sample Page - Tech Order

2.1 Sample Tech Order

TO 2J-F110-16-6
WP 003 00

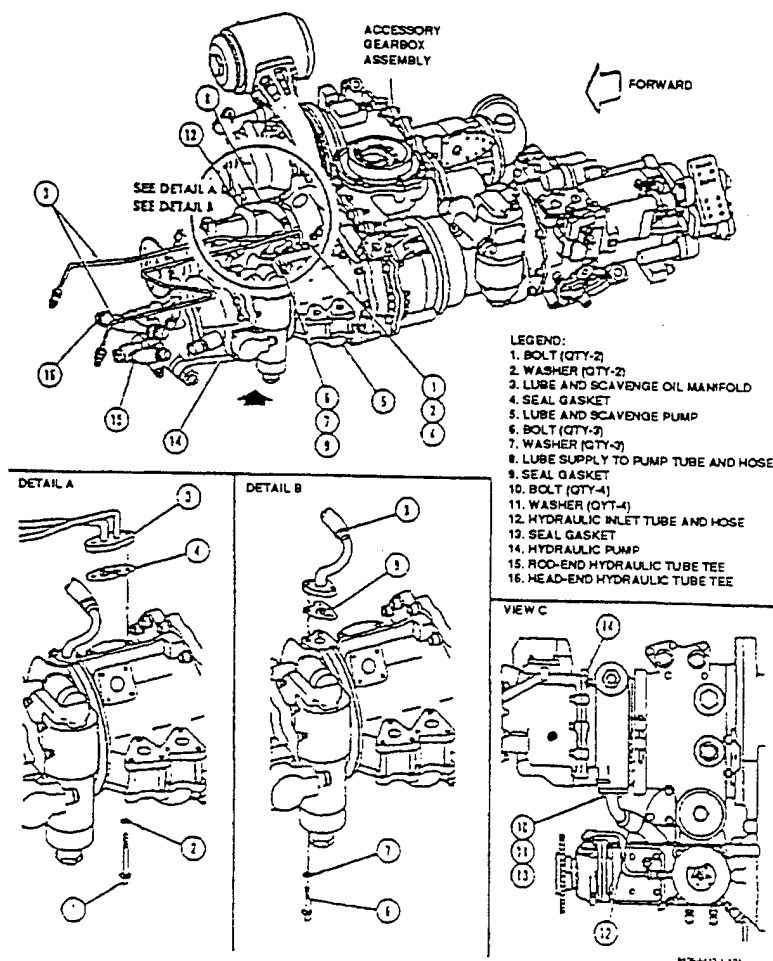Figure 2-5 Manifold, Lube Tube and Hose, and Hydraulic Tube and Hose Removal

LEGEND:
1. BOLT (QTY-2)
2. WASHER (QTY-2)
3. LUBE AND SCAVENGE OIL MANIFOLD
4. SEAL GASKET
5. LUBE AND SCAVENGE PUMP
6. BOLT (QTY-3)
7. WASHER (QTY-3)
8. LUBE SUPPLY TO PUMP TUBE AND HOSE
9. SEAL GASKET
10. BOLT (QTY-4)
11. WASHER (QYT-4)
12. HYDRAULIC INLET TUBE AND HOSE
13. SEAL GASKET
14. HYDRAULIC PUMP
15. ROD-END HYDRAULIC TUBE TEE
16. HEAD-END HYDRAULIC TUBE TEE

2-1

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a. Remove boost pump seal drain fuel tube as follows (figure 2):

(1) Cut and remove safety wire from coupling nuts on both ends of boost pump seal drain fuel tube.

WARNING

Fuel, MIL-T-5624, is flammable and toxic to skin, eyes, and respiratory tract. Skin and eye protection is required. Avoid repeated or prolonged contact. Use in a well-ventilated area.

CAUTION

When disconnecting tubing, use two wrenches to avoid overstressing. Use one wrench to hold mating tube connector and the other wrench to loosen attaching tube coupling nut.

(2) Disconnect coupling nuts from both ends of boost pump seal drain tube at boost pump and aft main drain manifold. Remove boost pump seal drain fuel tube.

(3) Cover ends of boost pump seal drain fuel tube, ports of boost pump, and ports of manifold with plastic bags, PPP-B-26, or other suitable covers.

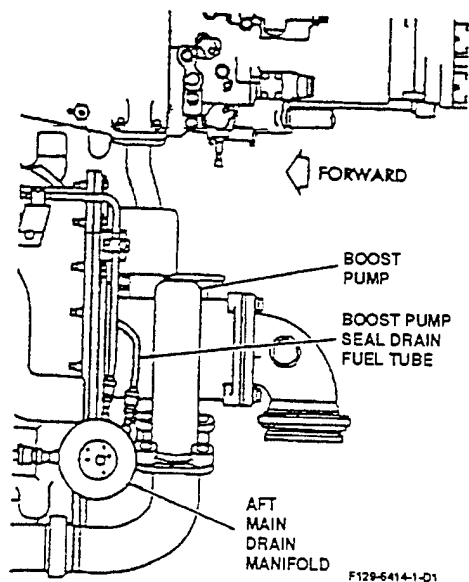b. Remove AC generator (TO 2J-F110-16-3, WP 005 00).

Figure 2-6 Boost Pump Seal Drain Fuel Tube Removal

CHAPTER 3

The SGML Transfer Story

3.1 Part One - The Start

It was a dark and rainy night. Edna sat in front of her computer terminal, lines of care etched into her young, care-worn face. Knowing full well, even as she began to enter her confession into the IWSDB, that she would be subject to questions from higher authority, maybe even the MAISRC. She crouched over her care-worn keyboard and started to enter her tale. She had agonized long and hard before making this decision, fearing the wrath of the CALS ISG committee on The Suppression of Overblown Phrases. Finally she began to type the name(s) of the guilty person(s). Just as she was about to run a spell check on the list(s) of government(s) agencies a shadow appeared from over her shoulder, blanking out the blanked-out portion of the screen and she knew that the guilty person(s), or significant other(s), was about to stop her from continuing her expose, or at least preventing her from saving it to the B drive. She emitted a high-pitched scream and then, after being bound and gagged and her password removed, she started to tell her amazing story to her captor(s).

Each company/organization will add one or two paragraphs to the story. Graphics may be added but the total contribution is not to exceed one page. Change the title to reflect the name of your company/organization and continue the story.

3.2 Part Two - Edna Begins Her Story, By US Lynx

"Last fall there were persistent rumors about a shadowy SGML initiative code-named PEDS. No one was sure who was sponsoring the research, but a 'Deep Throat' kind of character called me one day to say that the system was undergoing a trial during a hot congressional race in Washington state. He said I could find out more about PEDS, which 'Throat' said stood for Political Exaggeration Detection and Sampling system, during an environmental rally in the Cascades. I thought I had to be there.

"Tempers were high at the rally, because a "Wise Use" pro-clearcutting group had shown up. As I was fighting my way through the screaming crowd, I saw a mousy woman suddenly appear as if from nowhere. The crowd parted to let her pass, a few "Wise Users" snickering, the environmentalists watching in awe. My God, it was the Log Lady!

"And she was cradling not a real branch, but a compressed sawdust fireplace log, like the ones city folks buy for their very expensive fireplaces. Trailing behind the Log Lady was a faint aura, at the edge of which I thought I saw the sweep of an ermine cape.

"She came straight to me and looked searchingly into my eyes. 'I sense you work for the government. Let me tell you what's been happening since the Twin Peaks crew left me in the woods with that owl,' she began. I asked, 'Does it involve that nebulous shape standing behind your shoulder?' 'You must be psychic,' she whispered with rising excitement. 'Two weeks ago, in the woods, I was visited by an apparition of Elvis, and he hasn't left me alone since then.' Ba-ba-booey!

"A sudden rush of wind trembled the trees. I couldn't suppress a shiver. For the past few months reports had come to my office of dead Elvises appearing to cows throughout the Midwest and upsetting their milk production by crooning 'Love Me Tender' for hours. And here was another Elvis. Ba-ba-booey!!!

"The Log Lady lowered her voice conspiratorially and told me that Elvis had been warning her about a little man with big ears from Texas and his sidekick Yimbo. (I knew that Yimbo and he reminded me less of Tonto than Gomer.) 'He has something to do with what Elvis calls PEDS or PEZ – some kind of electronic response system – and has a DDT or DTD that he's fiddling with.' But there her information ended. The rally seemed to go on forever and not even when Willie Nelson gave us a ten-song set did anyone else approach me. I felt frustrated, night had fallen, and I told the Log Lady I needed to leave. She (and Elvis) wanted a ride down the road. Back at my rented 4X4 Log Lady and Elvis had a brief scuffle over who got to sit in front; Log Lady won.

"Her (their) motel was positively Batesian. Log Lady didn't take to brief goodbyes, and I guess my impatience was showing because suddenly she seemed to melt into mist before my eyes. I blinked but she was really gone. And Elvis? Sitting in the dark back seat grinning a little. He said, 'Just a sample of virtual reality projection with a psychological kicker added: you wanted to see her.' And he too began to fade, until all one saw was that famous Cheshire cat grin (the stamp!). Oh Elvis, you cyber-chunk, I thought.

"I was about to speed away, but I noticed something glowing on Elvis's seat. I picked it up and saw it was a cassette labeled 'Unpublished Beatles Songs.' Was this Elvis' secret taste in music or did this unpublished Beatles song hide a secret about the PEDS project, like 'Revolution Number Nine' played backward? Why was Elvis appearing all over the country and why was he projecting out the Log Lady, with her warnings about the dwarf from Dallas? What did this dwarf know about the secret PEDS project and who was running it? Questions and more questions. For answers, I leaned forward to push the tape into the player. Something hit me from behind and I blacked out."

3.3 Part Three - Blood, Blood, and more...Blood, by Data Conversion Laboratory

I came to slowly, dried blood sticking my eyeballs to the steering wheel. I pulled back slowly, my vision was a bit foggy, but I could make out the huge blood stain on the cassette player, the seat cushion, and the still semi-viscous blood puddle on the dash.

Blood dripped from the already-coming-loose-again-ceiling fabric, and it dripped from the door handles and window buttons, and it felt wet and dry, and wet and dry on my stomach where my blood soaked crew-neck shirt blew back and forth in the slight breeze.

3-1

My first thoughts were, is this my blood? Where did I get all this blood? I don't recall having that much blood. And if not my blood, whose?

As my vision started clearing up, I began to notice something strange. The blood stain on the seat cushion had formed what appeared to be a numeric string. Two of the digits were hard to make out, but as the blood dried, it became obvious to me that the number 38784 appeared on the seat. Still partially dazed, I thought to myself that I'd seen that number before, but couldn't remember where or when. But deep in my gut I knew that this was the key that would help me answer my continually growing list of questions.

3.4 PART FOUR — MEANING IN "38784", BY INTER-LEAF

38784 — is it a mystical pattern of digits, or a holistic grouping? Is there meaning revealed in the image appearing after all that blood?

What is the meaning of the patterns in the digits? left middle right: thrice seven times four is 84, just how 38784 concludes. That repetition and redundancy could well be a checking scheme to make sure that no information is lost in presentation. Now we have left the interiors: more repetition, both eights. A common financial reporting system uses fractions of eights. Could that be shorthand for 3/8 and 7/8? Perhaps that reappearing of the eights is symbolic of Elvis's reported reappearing? Or In even times: The product of the evens, eight times eight times four is 128. That's America's Technological Highway in Massachusetts. Isn't that a natural linkage? The Log Lady appears here as well using those even digits log base four of 8 times 8 is 3. Isn't that odd? Speaking of odd, the sum of the odd three plus seven is ten, whose prime factors complete the primes up to ten: 3 7 2 5. How many primes are there there: just four, another use of that last digit. How many Elvises are there? The most telling is the double reversal of direction: first reversal (about the 7) is 48783. Then 48783 minus 38784 is 9999. The second reversal of 9999 about their horizontal middle gives 6666. Four sixes again reversing the first and last digits of 38784 is just three sixes. Everyone knows that that 666 is code for the devil, just as the devil is lived reversed. I note that the blood darkens, and where the 38784 had formed, now a hole appears.

I now explore that dark hole. Perhaps the meaning of that darkening and disappearing of the 38784 is holistic. The insight from the numerology suggest some vision, some interpretation, some structure, some formalities. Perhaps there is a combination of visual information, extensive narrative information to generalize what just shakes out of those visuals, and some formalisms that try to make "still clearer" those visions through what seem to be never-ending "Fantastic Odes Suggesting Indiscretions", or FOSIs for short. There is need for an unlimited number of Elvises to forever come up with new variations by just shake, rattle, and rolling through the unending records of FOSIs. I must find where that dark hole called 38784 actually is, so I can again approach an Elvis. I wonder which one? I wonder how many odes can come from one Elvis?

3.5 Part FIVE -

Once upon a time....... and they lived happily ever after

Add your part of the story starting here..